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Philadelphia, PA 19104
USA

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Transmitted via Email

January 19, 2021

Ms. Lisa Denmark
Remedial Project Manager
U.S. Environmental Protection Agency
Hazardous Site Cleanup Division, 3HS23
1650 Arch Street
Philadelphia, PA 19103

RE: QUARTERLY PROGRESS REPORT FOR THE AVTEX FIBERS SUPERFUND SITE FOR THE PERIOD OCTOBER 1 THROUGH DECEMBER 31, 2020 (FOURTH QUARTER)

Dear Ms. Denmark,

This quarterly progress report addresses the reporting requirements detailed in the 1999 Consent Decree between the United States of America and FMC Corporation to conduct removal and remedial actions. Pursuant to the Consent Decree and in accordance with Section XI, Paragraph 45, FMC has prepared this progress report to describe actions taken during the fourth quarter of 2020.

If you have any questions or comments, please call me at 215-299-6047.

Sincerely,

Brian McGinnis
Senior Remediation Manager

Enclosure (1)
cc: A. Geyer, USEPA
C. Marquette, VADEQ
H. Philip, Parsons
M. Robinson, Parsons

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1.0 INTRODUCTION

FMC Corporation (FMC) has conducted removal and remedial activities at the Avtex Fibers Superfund Site, Front Royal, Virginia (Site). The removal action, remedial design, and remedial action activities were performed pursuant to the 1999 Consent Decree between the United States of America and FMC Corporation (effective October 21, 1999).

Upon completion of the Groundwater Leachate Treatment Plant (GLTP) in 2014 following Site remediation activities, the Site transitioned into the Operations and Maintenance (O&M) phase. This report documents the O&M and monitoring activities and findings for the fourth quarter reporting period October 1 through December 31, 2020. Daily operations and maintenance activities are ongoing and meet the requirements in the *Sitewide O&M Plan* (FMC, May 2015).

In accordance with Section XI of the Consent Decree, this quarterly progress report contains the following:

- Description of actions taken, reports prepared, and a summary of data generated by FMC during the fourth quarter (October, November, and December 2020).
- Description of the problems encountered this quarter and actions taken to mitigate these problems.
- Actions scheduled for the next quarter (January, February, and March 2021).
- Update on the schedule of actions and percent completion of tasks.
- Modification to work plans or other schedules.
- Activities undertaken in support of the U.S. Environmental Protection Agency (USEPA) Community Relations Plan.

Attachment 1 lists correspondence and deliverables transmitted from FMC or FMC contractors to USEPA and the Virginia Department of Environmental Quality (VADEQ), and from USEPA, USEPA contractors or VADEQ to FMC during the fourth quarter of 2020.

2.0 OU-7, OU-10, AND NON-TIME CRITICAL REMOVAL AND REMEDIAL ACTIONS

2.1 ACTIONS TAKEN AND REPORTS PREPARED (FOURTH QUARTER 2020)

- Completed quarterly inspection as described in Section 6 of Part 1 of the *Sitewide O&M Plan*. The results are presented in **Attachment 2**.
- Quarterly monitoring of gas vents was completed as described in Section 3.0 of Part 1 of the *Sitewide O&M Plan* and as amended by the February 28, 2018, letter from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Sitewide Post-Closure Care Operations and Maintenance Plan" (May 2015).

- Quarterly post-closure OU-7 and site perimeter real-time air monitoring was completed as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011). The results are presented in **Attachment 3**.
- Collected low flow groundwater samples from low recharge wells 215 and 306.
- Collected GLTP influent samples from wells TW-02 and TW-03 (wells were not operational during the annual sampling event conducted in the third quarter).

2.2 DATA GENERATED (FOURTH QUARTER 2020)

As required by the *Air Monitoring Plan* (2011), post-construction annual air sampling for reduced sulfur compounds was conducted in August 2020 and quarterly air monitoring for hydrogen sulfide and organic vapors was completed in December 2020. The results of the quarterly air monitoring are provided in **Attachment 3**.

The quarterly air monitoring results indicated:

- Hydrogen sulfide was detected at OU-7 monitoring location NE at a concentration of 0.001 ppm, it was not detected at the Site perimeter sample locations in December 2020.
- No volatile organic compounds (VOCs) were detected at any of the monitoring locations.

The following instruments were utilized to collect the real-time readings:

- Hydrogen sulfide: Jerome 613X
- Organic vapor: MiniRAE 3000

The results from the annual groundwater, surface water, and sediment sampling have been received and validated. These results will be submitted in the annual groundwater, surface water, and sediment sampling report under separate cover.

2.3 PROBLEMS ENCOUNTERED AND REMEDIES (FOURTH QUARTER 2020)

No problems were encountered during the reporting period.

2.4 ACTIONS TO BE COMPLETED NEXT PERIOD (FIRST QUARTER 2021)

- Complete quarterly inspection as described in Section 6 of Part 1 of the *Sitewide O&M Plan*.
- Complete quarterly monitoring of gas vents as described in Section 3.0 of Part 1 of the *Sitewide O&M Plan* and as amended by the February 28, 2018 letter, from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Sitewide Post-Closure Care Operations and Maintenance Plan (May 2015)."
- Complete quarterly post-closure OU-7 and site perimeter real-time air monitoring as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011).
- Conduct the quarterly stormwater inspection.

3.0 GROUNDWATER AND LEACHATE TREATMENT PLANT (GLTP)

3.1 ACTIONS TAKEN AND REPORTS PREPARED (FOURTH QUARTER 2020)

The GLTP operated and discharged to the South Fork Shenandoah River for 92 days, from October 1 to December 31, 2020.

Discharge monitoring was completed as required by the July 24, 2014, VADEQ Final Fact Sheet and Applicable or Relevant and Appropriate Requirements (ARARs) for the discharge of effluent from the GLTP. Monthly discharge monitoring included: flow, pH, five-day biological oxygen demand (BOD_5), total suspended solids (TSS), and carbon disulfide (CS_2). The daily maximum and monthly average flow and constituents of concern data are listed in the Discharge Monitoring Reports (DMRs), which were submitted during the fourth quarter of 2020 and are summarized in Table 1.

Table 1. Summary of 4Q2020 Monthly Effluent Sampling

Parameter	Units	Permit Limits	October 2020		November 2020		December 2020	
			monthly avg	*daily max*	*monthly avg*	*daily max*	*monthly avg*	*daily max*
Flow	**MGD**	0.396	0.061	0.078	0.063	0.087	0.064	0.085
pH	**S.U.**	6.5 – 9.0*	7.6 – 8.1		7.6 – 8.0		7.7 – 8.0	
BOD_5	**mg/L**	24 / 64**	<QL	<QL	0.50	2.00	<QL	<QL
TSS	**mg/L**	40 / 130**	<QL	<QL	<QL	<QL	<QL	<QL
CS_2	**µg/L**	0.1 mg/L***	<QL	<QL	<QL	<QL	<QL	<QL

Where parameters were non-detect, the value '0' was used for calculating average and maximum concentrations.
* = Permit limit range for pH as specified in the ARARs.
** = These values represent monthly average and daily maximum permit limits.
*** = There is no established permit limit for CS_2. The value is a monthly action level specified in ARAR.
MGD = million gallons per day
S.U. = standard units
mg/L = milligrams per liter
µg/L = micrograms per liter
<QL = reported less than the quantitation limit

Discharge flow and pH were monitored continuously during discharge. The pH monitoring results for each month of the reporting period were included with the monthly DMRs. The effluent pH was within the range of 6.5 to 9.0, as specified in the ARARs.

BOD_5 was monitored weekly. The permitted monthly daily average limit for BOD_5 of 24 mg/L and the permitted monthly maximum daily limit of 64 mg/L were not exceeded during the reporting period. The October, November, and December 2020 BOD_5 monthly average and daily maximum concentrations were below the method detection limit and quantitation limit.

TSS was also monitored weekly. The permitted monthly daily average limit for TSS of 40 mg/L and the permitted monthly maximum daily limit of 130 mg/L were not exceeded during the reporting period. The

October, November, and December 2020 TSS monthly average and daily maximum concentrations were below the method detection limit and quantitation limit.

Carbon disulfide was monitored monthly. The results for the monthly samples collected in the fourth quarter of 2020 were less than the 0.1 mg/L monthly action level specified in the ARARs.

3.2 DATA GENERATED (FOURTH QUARTER 2020)

Flow totals for the lift stations, test wells and viscose basin are contained in **Attachment 4** (Table 4.1). DMRs were submitted to the VADEQ and USEPA by the tenth of each month.

3.3 PROBLEMS ENCOUNTERED AND REMEDIES (FOURTH QUARTER 2020)

- As previously reported, a minor leak was identified at the Site sulfuric acid storage tank in early July 2020. The leak was contained and is stable. FMC is in the process of replacing the tank, which should be completed during the first quarter of 2021.
- TW#2 was offline due to a transducer electrical issue, and in October, a new transducer and surge protector was installed. Full diagnostics of sensor, wiring, and PLC operations was performed to identify any areas that need additional improvement.
- In late November, tree trimming, and tree debris removal was conducted at the basins, site-wide. Tree trimming also occurred around the TW#3 riverbank area to improve radio communications to the GLTP.
- No flow detected at TW#3 in mid-December. The well's pressure reducing valve had become stuck open with debris, which was preventing flow to the GLTP. The valve was removed, cleaned, and checked for proper function prior to reinstallation.
- During TW#2 troubleshooting on December 16, the flow meters to all three TWs were disabled. FMC has since resolved the issue.

3.4 ACTIONS TO BE TAKEN NEXT PERIOD (FIRST QUARTER 2021)

- Continue operations and maintenance of the GLTP.
- Continue to collect GLTP system discharge samples as required by the July 24, 2014, VADEQ Final Fact Sheet and ARARs for the discharge of effluent from the GLTP.
- Collect quarterly depth to water measurements.

4.0 OTHER SITE RELATED DOCUMENTS AND ITEMS

4.1 ACTIONS TAKEN AND REPORTS PREPARED (FOURTH QUARTER 2020)

Quarterly inspections of seep areas, river berms and gas vents were conducted, and inspection reports were completed.

Rainfall data are presented in Table 4.2 (**Attachment 4**). A total of 4.9 inches of precipitation fell on the Site during the fourth quarter of 2020 (October, November, and December 2020). The total precipitation

through the end of 2020 (36.1 inches) represents approximately 91% of the average Site total yearly precipitation of 39.6 inches.

4.2 ACTIONS TO BE TAKEN NEXT PERIOD (FIRST QUARTER 2021)

Quarterly inspections of seep areas, river berms and gas vents will be conducted, and inspection reports will be completed.

ATTACHMENTS

1 Summary of the Quarterly Correspondence
2 Sitewide Quarterly Inspection Reports (with repairs photo log)
3 OU-7 and Site Perimeter Air Monitoring Results
4 GLTP Discharge Monitoring and Information
   a. Table 4.1 – Monthly Flow Totals Avtex Site Lift Stations, Test Wells and Viscose Basin
   b. Table 4.2 - Site Rainfall Data

ATTACHMENT 1

SUMMARY OF QUARTERLY CORRESPONDENCE

ATTACHMENT 1

LIST OF CORRESPONDENCE AND DELIVERABLES FOR THE PERIOD OCTOBER 1, 2020 TO DECEMBER 31, 2020, AVTEX FIBERS SUPERFUND SITE, FRONT ROYAL, VIRGINIA

FMC to VADEQ

- October 7, 2020: *September DMR - Avtex Fibers Site, Front Royal, VA* - September 2020 Discharge Monitoring Report Submission (submitted to VADEQ and EPA)
- November 6, 2020: *October DMR - Avtex Fibers Site, Front Royal, VA* - October 2020 Discharge Monitoring Report Submission (submitted to VADEQ and EPA)
- December 8, 2020: November *DMR - Avtex Fibers Site, Front Royal, VA* - November 2020 Discharge Monitoring Report Resubmitted per VADEQ request (submitted to VADEQ and EPA)

VADEQ to FMC

- October 14, 2020: *September DMR - Avtex Fibers Site, Front Royal, VA* - Discharge Monitoring Report Received (sent to FMC and EPA)
- November 9, 2020: *October DMR - Avtex Fibers Site, Front Royal, VA* - DMR Received, however, request to re-send was made as electronic document did not upload properly for Ms. Marquette. (sent to FMC and EPA)

FMC to EPA

- October 14, 2020: *Avtex - EPA Quarterly Report for July - September 2020* - Quarterly Progress Report for the Avtex Fibers Superfund Site for the Period July 1 to September 30, 2020, which included the *Addendum to Basin Repair Construction Summary Report* (submitted to VADEQ and EPA)

ATTACHMENT 2

SITEWIDE QUARTERLY INSPECTION REPORTS

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague
Date: 12-11-2020
Report No.: 2020-12
Areas Inspected: See Map

1. Remediation/Restoration Areas

Questions	Response		Comments and Recommendations
Is settlement or standing water evident? If Yes, describe the degree of settlement(s) (slight, moderate, significant), record approximate dimensions, and indicate the location(s) on an attached map.	☑ Yes	☐ No	Small area of standing water noted on roadway to LS-1. All other areas have been repaird.
Is erosion evident? If Yes, describe the type of erosion (rills, gullies), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.	☐ Yes	☑ No	
Are potential leachate seeps evident or migration of contamination? If Yes, describe the nature (size, color, flow rate), record location on an attached map, and photograph. [Note: Check former seep areas in unnamed tributary north of VB 4-6, check pond area north of VB 9, and check other likely areas (e.g., embankments of VBs, SBs)]	☐ Yes	☑ No	See map for locations. Potential seeps: -SE of VB-2&3 (wet due to rain) -NW of VB-7&8 (Dry)
Do landfill/basin embankments show signs of erosion, failure (e.g., cracking, sloughing) or migration of contamination (e.g., seeps, exposed waste)? If Yes, describe the nature (type, size), record location on an attached map, and photograph [Note: Check river-side of embankments along river, if safe to do so.]	☐ Yes	☑ No	
Is vegetation distressed or are bare areas evident? If Yes, describe the type of disorder (distressed, sparsely vegetated, bare), record approximate dimensions and indicate location(s) on an attached map.	☑ Yes	☐ No	Isolated/minor bare areas noted. See map for locations. With few exceptions, vegetation is filling in.

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague
Date: 12-11-2020
Report No.: 2020-12
Areas Inspected: See Map

Questions	Response		Comments and Recommendations
Is there woody vegetation greater than 2 inches in diameter or 5 feet in height on the cover system(s)? If Yes, describe where and actions to be taken (refer to Section 4.2 of the O&M Plan).	☐ Yes	☑ No	
Is any other damage evident? If Yes, describe the type of damage(s) and indicate the location(s) on an attached map.	☐ Yes	☑ No	
Are obstruction(s) (brush, debris, timber, leaves, sediment) interfering with the proper functioning of ditches, gutters or flumes? If Yes, describe the type(s) of obstruction(s) and indicate the location(s) on an attached map.	☐ Yes	☑ No	
Is sediment deposited in diversion berms, ditches gutters, flumes or culverts deeper than ¼ of the original channel depth (shown on the contract drawings) or culvert diameter? If Yes, record approximate dimensions and indicate locations on an attached map.	☐ Yes	☑ No	

Quarterly Inspection Report

Inpected by: M. Harder / K. Teague
Date: 12-11-2020
Report No.: 2020-12
Areas Inspected: See Map

2. Surface Water Drainage and Erosion Control System

Questions	Response		Comments and Recommendations
Is erosion evident? If Yes, describe the drainage structure inspected (ditch, gutter, flume, culvert, outfall, rip-rap), the type of erosion (rills, gullies, washouts, slope failure), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.	☐ Yes	☑ No	Minor erosion noted in a few isolated areas. Other previously noted areas have been repaired.
Is overall shape, configuration, and alignment of the drainageway as shown on the drawings? If No, describe the type of distortion (damaged, eroded, slope failure), record approximate dimensions and indicate location(s) on an attached map.	☑ Yes	☐ No	
Is erosion evident at drainage outlet aprons? If Yes, record approximate dimensions and indicate location(s) on an attached map.	☐ Yes	☑ No	

Inspection Checklist (check items that were inspected; document concerns noted; refer to attached Drawings for specific areas)

Viscose Basins 1-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles	☑ Rip-rap channels	☑ Access road near unit	☐

Viscose Basins 4-6

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles - N, E, & W of VB 4-6; - Pond W of VB 4-6	☑ Rip-rap channels	☑ Down chutes	☑ Gas Vent Filter & Fence
☑ Former seep area - N of VB 4-6	☑ LS #1 & #2 and Fencing	☑ Access road near unit	☐

Viscose Basins 7-8

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert Inlets & outles (between VB-1 and VB-7)	☑ Rip-rap channels	☑ Down chutes	☑ Leachate Collection Manhole (MW VB7)
☑ Access road near unit	☐	☐	☐

Viscose Basins 9-11

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Drop inlests on VB-11	☑ Culver inlets & outlets (S&W VB-11; N VB-11 & VB-9; and SW VB-10)	☑ Rip-rap channels	☑ Down chutes
☑ Access road near unit	☑ Seep area in pond north of VB-9	☑ VB 9-11 fence and gates	☑ LS #4 and Fencing

New Landfill

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE & SE of NLF)	☑ Rip-rap channels	☑ Down chutes	☑ LS #3 and Fencing
☑ Access road near unit	☐	☐	☐

SB-1

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE SB-1; SB-2; SE SB-3; NE SB-4; & S SB-4)	☑ Rip-rap channels & outlets by River	☑ Down chutes (SB-1 & SB-4)	☐
☑ Access road near unit	☐	☐	☐

Inspection Checklist (check items that were inspected; document concerns noted; refer to attached Drawings for specific areas)

SB-2

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & Outlets (S & W Sides)
☑ Berms along River (site & river side)	☑ Rip-rap channels & outlets by River	☑ Access road near unit	☐

SB-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & Outlets (SE))	☑ Rip-rap channels & outlets by River	☑ Drop inlets (W side)	☑ Access Road near unit
☐	☐	☐	☐

SB-4

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Culvert inlets & outlets (NE & S sides)	☑ Down chutes (S Side)	☑ Drop inlet (N side)	☑ Berms along River (site & river side)
☑ Access road near unit	☐	☐	☐

SB-5

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Gas Vents
☑ Berms along River and E side	☑ Access Road near unit	☐	☐
☐	☐	☐	☐

FAB 1-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & outlets (E & S FAB1-2; SW FAB3)
☑ Access Road near unit	☐	☐	☐

FAS & FARA

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Culvert inlets & outlets (E & N FAS; E FARA)
☑ Access Road near unit	☐	☐	☐

EL, PB 1-2, PB-3

☑ Vegetation	☑ Erosion	☑ Settlement	☑ Rip-rap Channels
☑ Culvert inlets & outlets (E & W EL; NW PB-1-2; S PB-3)	☑ Access Road near unit	☐	☐

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 1

Unit: *OU-10*

Basin/Landfill:

VB-4, 5, & 6

Date : 12/11/2020

Photo Description: Two areas of former standing water adjacent to LS-2. Wet due to recent rainfall

Photo Number: 2

Unit: *OU-10*

Basin/Landfill:

VB-4, 5, & 6

Date : 12/11/2020

Photo Description: Standing water on access path west of VB-4,5, & 6 (path to LS-1)

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 3

Unit: *OU-10*

Basin/Landfill:

VB-2&3 / NLF

Date : 12/11/2020

Photo Description: **Area of Former Standing Water** (grass growing).

Photo Number: 4

Unit: *OU-10*

Basin/Landfill:

VB-2&3, and NLF

Date : 12/11/2020

Photo Description: : Bare soil (~10' x30`) with rills southeast of VB-2&3 (Sediment basin between NLF and VB-2&3). Stable and dry, grass returning. Water flowing due to recent rain.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 5

Unit: *OU-7*

Basin/Landfill:

VB-9, 10, & 11

Date : 12/11/2020

Photo Description: Area around wells 103/203/303 – wet due to recent rainfall.

Photo Number: 6

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 12/11/2020

Photo Description: Bare patches and exposed matting at down chute in south side of VB-10.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 7

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 12/11/2020

Photo Description: Bare patches and exposed matting at down chute on south side of VB-10.

Photo Number: 8

Unit: *OU-7*

Basin/Landfill:

VB-10

Date : 12/11/2020

Photo Description: Settlement in southern section of VB-10 – repairs complete.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 9

Unit: *OU-7*

Basin/Landfill:

VB-9

Date : 12/11/2020

Photo Description: Former settlement on previously repaired area on VB-9 (30' x 40)- repairs complete and grass growing. Small area of standing water due to recent rainfall.

Photo Number: 10

Unit: *NTCRA Basins*

Basin/Landfill:

SB-3

Date : 12/11/2020

Photo Description: Former settlement on previously repaired area on VB-9 (30' x 40)- repairs complete and grass growing.

Quarterly Inspection Report Photographic Log
Avtex Superfund Site
Front Royal, Virginia

Photo Number: 11

Unit: *NTCRA Basins*

Basin/Landfill:

SB-3

Date : 12/11/2020

Photo Description: Former areas of settlement in front of inlets between SB-3 and SB-2 – repairs complete and grass growing.

Photo Number: 12

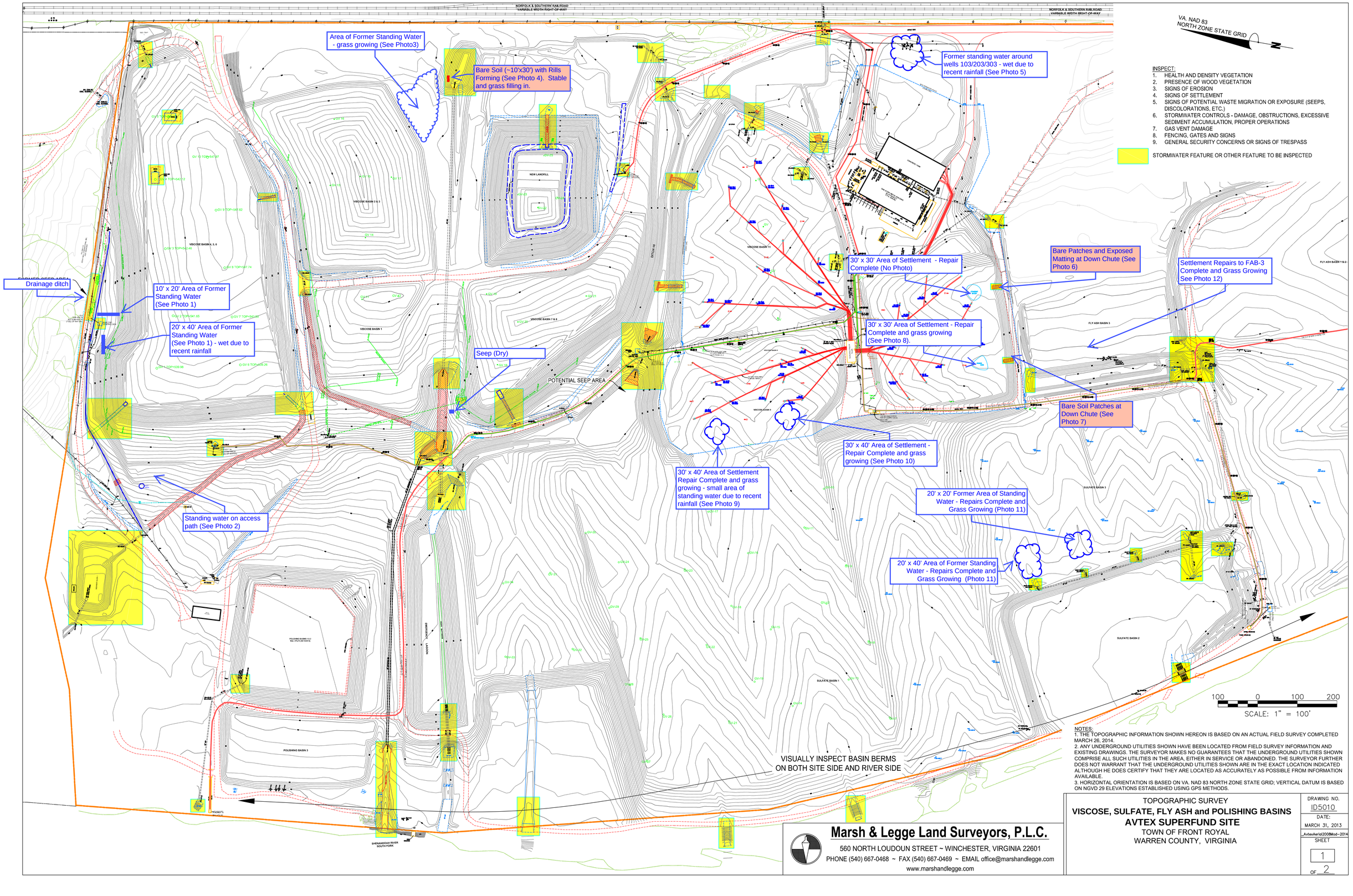
Unit: *NTCRA Basins*

Basin/Landfill:

FAB-3

Date : 12/11/2020

Photo Description: Former area of settlement on FAB-3 – repairs complete and grass growing.



NOTES:
1. THE TOPOGRAPHIC INFORMATION SHOWN HEREON IS BASED ON AN ACTUAL FIELD SURVEY COMPLETED MARCH 26, 2014.
2. ANY UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE.
3. HORIZONTAL ORIENTATION IS BASED ON VA. NAD 83 NORTH ZONE STATE GRID; VERTICAL DATUM IS BASED ON NGVD 29 ELEVATIONS ESTABLISHED USING GPS METHODS.

Marsh & Legge Land Surveyors, P.L.C.
560 NORTH LOUDOUN STREET ~ WINCHESTER, VIRGINIA 22601
PHONE (540) 667-0468 ~ FAX (540) 667-0469 ~ EMAIL office@marshandlegge.com
www.marshandlegge.com

TOPOGRAPHIC SURVEY
VISCOSE, SULFATE, FLY ASH and POLISHING BASINS
AVTEX SUPERFUND SITE
TOWN OF FRONT ROYAL
WARREN COUNTY, VIRGINIA

DRAWING NO.
ID5010
DATE:
MARCH 31, 2013
_AvtexAerial2008Mod--2014
SHEET
1
OF 2

VA. NAD 83
NORTH ZONE STATE GRID

N

NORFOLK & SOUTHERN RAILROAD
VARIABLE WIDTH RIGHT-OF-WAY

FLY ASH BASIN 6

SULFATE BASIN 5

FLY ASH BASIN 1 & 2

FLY ASH BASIN 3

SULFATE BASIN 4

SULFATE BASIN 3

SULFATE BASIN 2

SHENANDOAH RIVER

See Sheet 1 of 2

VISUALLY INSPECT BASIN BERMS
ON BOTH SITE SIDE AND RIVER SIDE

INSPECT:
1. HEALTH AND DENSITY VEGETATION
2. PRESENCE OF WOOD VEGETATION
3. SIGNS OF EROSION
4. SIGNS OF SETTLEMENT
5. SIGNS OF POTENTIAL WASTE MIGRATION OR EXPOSURE (SEEPS, DISCOLORATIONS, ETC.)
6. STORMWATER CONTROLS - DAMAGE, OBSTRUCTIONS, EXCESSIVE SEDIMENT ACCUMULATION, PROPER OPERATIONS
7. GAS VENT DAMAGE
8. FENCING, GATES AND SIGNS
9. GENERAL SECURITY CONCERNS OR SIGNS OF TRESPASS

STORMWATER FEATURE OR OTHER FEATURE TO BE INSPECTED

100 0 100 200
SCALE: 1" = 100'

Marsh & Legge Land Surveyors, P.L.C.
560 NORTH LOUDOUN STREET ~ WINCHESTER, VIRGINIA 22601
PHONE (540) 667-0468 ~ FAX (540) 667-0469 ~ EMAIL office@marshandlegge.com
www.marshandlegge.com

TOPOGRAPHIC SURVEY
VISCOSE, SULFATE, FLY ASH and POLISHING BASINS
AVTEX SUPERFUND SITE
TOWN OF FRONT ROYAL
WARREN COUNTY, VIRGINIA

DRAWING NO.
ID5010
DATE:
MARCH 13, 2014
...Avtex\Aerial2008Mod~2014
SHEET
2
OF 2

ATTACHMENT 3

OU-7 AND SITE PERIMETER AIR MONITORING RESULTS

Air Monitoring Form
Avtex Superfund Site
Front Royal, Virginia

Date 12/9/2020
Technician M. Harder / K. Teague

Air Samples Collected?
☐ Yes
☑ No

Gas Monitoring Devices	Used (Y/N)	Calibrated (Y/N)	Date Calibrated	Initials
Jerome613X (low-level H_2S)	Y	Y	1/21/2020	MH
MiniRae 3000 (PID)	Y	Y	12/9/2020	MH
MultiRae (PID, O2, CO, H2S, LEL)	N	N		
Landtec GEM 5000	N	N		

Weather Conditions:

Precipitation (Current): ☐ Rain ☐ Snow ☐ Sleet ☐ Mix ☐ Other ☑ None
☐ Light ☐ Moderate ☐ Heavy

Current Temperature: 32 °F
Wind Direction (blowing from): SW (N, NE, SW, variable, etc.)
Wind Speed: 6 mph
Barometric Pressure: 29.86 inches
Cloud Cover: ☐ Clear ☐ Partly Cloudy ☑ Mostly Cloudy ☐ Cloudy/Overcast ☐ Foggy

Monitoring Location	Time	H_2S (ppm)	Oganic / VOC (ppm)	CS_2 (ppm)	Methane (%LEL)	Comments
OU-7 Perimeter - (H_2S Indicator Value = 0.006 ppm)						
N		0.000	0.0	--	--	
NE		0.001	0.0	--	--	Slight H2S odor
SE		0.000	0.0	--	--	
S		0.000	0.0	--	--	
SW		0.000	0.0	--	--	
NW		0.000	0.0	--	--	
Site Perimeter - (H2S Indicator Value = 0.0014 ppm)						
N		0.000	0.0	--	--	
NE		0.000	0.0	--	--	
E		0.000	0.0	--	--	
SE		0.000	0.0	--	--	
S		0.000	0.0	--	--	
SW		0.000	0.0	--	--	
W		0.000	0.0	--	--	
NW		0.000	0.0	--	--	
Downwind (location: NE)		0.000	0.0	--	--	

Activities Occuring on-site that might relate to air emissions:
Groundwater extraction and treatment.

If monitoring results are greater than one or more of above levels & sustained for 1 minute or longer, take following actions:
1. Notify FMC Site Manager, SSO, and EPA/EPA oversight representative; 2. Stop on-site intrusive operations and assess source(s);
3. Step-up work-zone & perimeter monitoring; 4. Perform monitoring the next day to verify levels.
If H2S > 0.1 ppm sustained for 5 minutes at Site Perimeter - Notify Warren County/Front Royal LEPC and Health Department.

FIGURE 1
AIR MONITORING LOCATIONS DURING OU-7 WORK
AVTEX FIBERS SUPERFUND SITE
FRONT ROYAL, VIRGINIA

LEGEND

- PROPERTY BOUNDARY
- SITE PERIMETER LOCATION
- OU-7 PERIMETER LOCATION

NOTE: DOWNWIND LOCATION TO BE DETERMINED BASED ON FIELD CONDITIONS.

500 250 0 500

SCALE IN FEET

G:\CAD\Drawings\FMC_Avtex Front Royal\0122736\A207.dwg

MLB/4-6-11

ERM, INC.

ATTACHMENT 4

GLTP DISCHARGE MONITORING AND INFORMATION

Table 4.1 Monthly Flow Totals - Fourth Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

October 2020									
Lift Stations Flow Report		Test Wells Flow Report				Viscose Basin Flow Report			
Date	Total LS Flow (MGD)	Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)	Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
10/1/2020	0.024	10/1/2020	0.059	0.000	0.000	10/1/2020	0.000	0.001	0.029
10/2/2020	0.033	10/2/2020	0.066	0.000	0.000	10/2/2020	0.000	0.001	0.029
10/3/2020	0.033	10/3/2020	0.038	0.000	0.000	10/3/2020	0.000	0.001	0.029
10/4/2020	0.020	10/4/2020	0.059	0.000	0.000	10/4/2020	0.000	0.001	0.029
10/5/2020	0.018	10/5/2020	0.066	0.000	0.000	10/5/2020	0.000	0.001	0.029
10/6/2020	0.004	10/6/2020	0.062	0.000	0.000	10/6/2020	0.000	0.001	0.029
10/7/2020	0.000	10/7/2020	0.066	0.000	0.000	10/7/2020	0.000	0.000	0.029
10/8/2020	0.000	10/8/2020	0.066	0.000	0.000	10/8/2020	0.000	0.001	0.029
10/9/2020	0.000	10/9/2020	0.066	0.000	0.000	10/9/2020	0.000	0.001	0.029
10/10/2020	0.000	10/10/2020	0.066	0.000	0.000	10/10/2020	0.000	0.001	0.029
10/11/2020	0.000	10/11/2020	0.066	0.000	0.000	10/11/2020	0.000	0.001	0.029
10/12/2020	0.000	10/12/2020	0.066	0.000	0.000	10/12/2020	0.000	0.001	0.029
10/13/2020	0.000	10/13/2020	0.066	0.000	0.000	10/13/2020	0.000	0.001	0.029
10/14/2020	0.000	10/14/2020	0.066	0.000	0.000	10/14/2020	0.000	0.001	0.029
10/15/2020	0.000	10/15/2020	0.066	0.000	0.000	10/15/2020	0.000	0.001	0.029
10/16/2020	0.010	10/16/2020	0.066	0.000	0.000	10/16/2020	0.000	0.001	0.029
10/17/2020	0.014	10/17/2020	0.066	0.000	0.000	10/17/2020	0.000	0.001	0.029
10/18/2020	0.014	10/18/2020	0.066	0.000	0.000	10/18/2020	0.000	0.000	0.029
10/19/2020	0.014	10/19/2020	0.066	0.000	0.000	10/19/2020	0.000	0.000	0.029
10/20/2020	0.009	10/20/2020	0.044	0.000	0.000	10/20/2020	0.000	0.000	0.029
10/21/2020	0.000	10/21/2020	0.059	0.000	0.000	10/21/2020	0.000	0.000	0.029
10/22/2020	0.003	10/22/2020	0.066	0.010	0.000	10/22/2020	0.000	0.000	0.029
10/23/2020	0.003	10/23/2020	0.059	0.013	0.000	10/23/2020	0.000	0.000	0.029
10/24/2020	0.000	10/24/2020	0.066	0.014	0.000	10/24/2020	0.000	0.000	0.029
10/25/2020	0.000	10/25/2020	0.066	0.016	0.000	10/25/2020	0.000	0.000	0.029
10/26/2020	0.023	10/26/2020	0.066	0.017	0.000	10/26/2020	0.000	0.000	0.029
10/27/2020	0.031	10/27/2020	0.025	0.017	0.000	10/27/2020	0.000	0.000	0.029
10/28/2020	0.031	10/28/2020	0.038	0.018	0.000	10/28/2020	0.000	0.000	0.029
10/29/2020	0.005	10/29/2020	0.053	0.004	0.000	10/29/2020	0.000	0.000	0.029
10/30/2020	0.004	10/30/2020	0.060	0.006	0.000	10/30/2020	0.000	0.000	0.029
10/31/2020	0.004	10/31/2020	0.063	0.006	0.000	10/31/2020	0.000	0.000	0.029

Table 4.1 Monthly Flow Totals - Fourth Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

November 2020									
Lift Stations Flow Report		Test Wells Flow Report				Viscose Basin Flow Report			
Date	Total LS Flow (MGD)	Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)	Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
11/1/2020	0.000	11/1/2020	0.066	0.000	0.000	11/1/2020	0.000	0.000	0.029
11/2/2020	0.010	11/2/2020	0.066	0.000	0.000	11/2/2020	0.000	0.000	0.029
11/3/2020	0.010	11/3/2020	0.066	0.000	0.000	11/3/2020	0.000	0.000	0.029
11/4/2020	0.004	11/4/2020	0.066	0.000	0.000	11/4/2020	0.000	0.000	0.029
11/5/2020	0.028	11/5/2020	0.066	0.000	0.000	11/5/2020	0.000	0.000	0.029
11/6/2020	0.029	11/6/2020	0.025	0.000	0.000	11/6/2020	0.000	0.000	0.029
11/7/2020	0.028	11/7/2020	0.059	0.000	0.000	11/7/2020	0.000	0.000	0.029
11/8/2020	0.000	11/8/2020	0.066	0.000	0.000	11/8/2020	0.000	0.000	0.029
11/9/2020	0.000	11/9/2020	0.066	0.000	0.000	11/9/2020	0.000	0.000	0.029
11/10/2020	0.026	11/10/2020	0.066	0.000	0.000	11/10/2020	0.000	0.000	0.029
11/11/2020	0.026	11/11/2020	0.066	0.000	0.000	11/11/2020	0.000	0.000	0.029
11/12/2020	0.029	11/12/2020	0.066	0.000	0.000	11/12/2020	0.000	0.000	0.029
11/13/2020	0.029	11/13/2020	0.059	0.000	0.000	11/13/2020	0.000	0.000	0.029
11/14/2020	0.008	11/14/2020	0.066	0.000	0.000	11/14/2020	0.000	0.000	0.029
11/15/2020	0.000	11/15/2020	0.066	0.000	0.000	11/15/2020	0.000	0.000	0.029
11/16/2020	0.000	11/16/2020	0.066	0.000	0.000	11/16/2020	0.000	0.000	0.029
11/17/2020	0.000	11/17/2020	0.035	0.000	0.000	11/17/2020	0.000	0.000	0.029
11/18/2020	0.000	11/18/2020	0.059	0.000	0.000	11/18/2020	0.000	0.000	0.030
11/19/2020	0.000	11/19/2020	0.066	0.000	0.000	11/19/2020	0.000	0.000	0.030
11/20/2020	0.000	11/20/2020	0.066	0.000	0.000	11/20/2020	0.000	0.000	0.030
11/21/2020	0.000	11/21/2020	0.066	0.000	0.000	11/21/2020	0.000	0.000	0.030
11/22/2020	0.000	11/22/2020	0.066	0.000	0.000	11/22/2020	0.000	0.000	0.030
11/23/2020	0.000	11/23/2020	0.066	0.000	0.000	11/23/2020	0.000	0.000	0.030
11/24/2020	0.005	11/24/2020	0.066	0.000	0.000	11/24/2020	0.000	0.000	0.030
11/25/2020	0.007	11/25/2020	0.066	0.000	0.000	11/25/2020	0.000	0.000	0.030
11/26/2020	0.007	11/26/2020	0.059	0.000	0.000	11/26/2020	0.000	0.000	0.030
11/27/2020	0.000	11/27/2020	0.066	0.000	0.000	11/27/2020	0.000	0.000	0.030
11/28/2020	0.000	11/28/2020	0.066	0.000	0.000	11/28/2020	0.000	0.000	0.030
11/29/2020	0.000	11/29/2020	0.065	0.000	0.000	11/29/2020	0.000	0.000	0.030
11/30/2020	0.008	11/30/2020	0.065	0.000	0.000	11/30/2020	0.000	0.000	0.030

Table 4.1 Monthly Flow Totals - Fourth Quarter 2020
Avtex Fibers Superfund Site
Lift Stations, Test Wells and Viscose Basin

December 2020											
Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report			
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
12/1/2020	1/0/1900		12/1/2020	0.065	0.000	0.000		12/1/2020	1/0/1900	1/0/1900	1/0/1900
12/2/2020	1/0/1900		12/2/2020	0.047	0.000	0.000		12/2/2020	1/0/1900	1/0/1900	1/0/1900
12/3/2020	1/0/1900		12/3/2020	0.054	0.000	0.000		12/3/2020	1/0/1900	1/0/1900	1/0/1900
12/4/2020	1/0/1900		12/4/2020	0.047	0.000	0.000		12/4/2020	1/0/1900	1/0/1900	1/0/1900
12/5/2020	1/0/1900		12/5/2020	0.059	0.000	0.000		12/5/2020	1/0/1900	1/0/1900	1/0/1900
12/6/2020	1/0/1900		12/6/2020	0.066	0.000	0.000		12/6/2020	1/0/1900	1/0/1900	1/0/1900
12/7/2020	1/0/1900		12/7/2020	0.034	0.000	0.000		12/7/2020	1/0/1900	1/0/1900	1/0/1900
12/8/2020	1/0/1900		12/8/2020	0.000	0.000	0.000		12/8/2020	1/0/1900	1/0/1900	1/0/1900
12/9/2020	1/0/1900		12/9/2020	0.039	0.001	0.012		12/9/2020	1/0/1900	1/0/1900	1/0/1900
12/10/2020	1/0/1900		12/10/2020	0.053	0.001	0.025		12/10/2020	1/0/1900	1/0/1900	1/0/1900
12/11/2020	1/0/1900		12/11/2020	0.060	0.000	0.028		12/11/2020	1/0/1900	1/0/1900	1/0/1900
12/12/2020	1/0/1900		12/12/2020	0.066	0.000	0.010		12/12/2020	1/0/1900	1/0/1900	1/0/1900
12/13/2020	1/0/1900		12/13/2020	0.045	0.000	0.000		12/13/2020	1/0/1900	1/0/1900	1/0/1900
12/14/2020	1/0/1900		12/14/2020	0.047	0.000	0.000		12/14/2020	1/0/1900	1/0/1900	1/0/1900
12/15/2020	1/0/1900		12/15/2020	0.046	0.000	0.000		12/15/2020	1/0/1900	1/0/1900	1/0/1900
12/16/2020	1/0/1900		12/16/2020	0.013	0.000	0.000		12/16/2020	1/0/1900	1/0/1900	1/0/1900
12/17/2020	1/0/1900		12/17/2020	0.000	0.000	0.000		12/17/2020	1/0/1900	1/0/1900	1/0/1900
12/18/2020	1/0/1900		12/18/2020	0.000	0.000	0.000		12/18/2020	1/0/1900	1/0/1900	1/0/1900
12/19/2020	1/0/1900		12/19/2020	0.000	0.000	0.000		12/19/2020	1/0/1900	1/0/1900	1/0/1900
12/20/2020	1/0/1900		12/20/2020	0.000	0.000	0.000		12/20/2020	1/0/1900	1/0/1900	1/0/1900
12/21/2020	1/0/1900		12/21/2020	0.000	0.000	0.000		12/21/2020	1/0/1900	1/0/1900	1/0/1900
12/22/2020	1/0/1900		12/22/2020	0.000	0.000	0.000		12/22/2020	1/0/1900	1/0/1900	1/0/1900
12/23/2020	1/0/1900		12/23/2020	0.000	0.000	0.000		12/23/2020	1/0/1900	1/0/1900	1/0/1900
12/24/2020	1/0/1900		12/24/2020	0.000	0.000	0.000		12/24/2020	1/0/1900	1/0/1900	1/0/1900
12/25/2020	1/0/1900		12/25/2020	0.000	0.000	0.000		12/25/2020	1/0/1900	1/0/1900	1/0/1900
12/26/2020	1/0/1900		12/26/2020	0.000	0.000	0.000		12/26/2020	1/0/1900	1/0/1900	1/0/1900
12/27/2020	1/0/1900		12/27/2020	0.000	0.000	0.000		12/27/2020	1/0/1900	1/0/1900	1/0/1900
12/28/2020	1/0/1900		12/28/2020	0.000	0.000	0.000		12/28/2020	1/0/1900	1/0/1900	1/0/1900
12/29/2020	1/0/1900		12/29/2020	0.000	0.000	0.000		12/29/2020	1/0/1900	1/0/1900	1/0/1900
12/30/2020	1/0/1900		12/30/2020	0.000	0.000	0.000		12/30/2020	1/0/1900	1/0/1900	1/0/1900
12/31/2020	1/0/1900		12/31/2020	0.000	0.000	0.000		12/31/2020	1/0/1900	1/0/1900	1/0/1900

Note: No flow recorded from 12/17 through the end of December, as the flow meters to all three TW wells were disabled during troubleshooting.

Table 4.2 Monthly Flow Totals - Fourth Quarter 2020
Avtex Fibers Superfund Site
Site Rainfall Data - October 1 - December 31, 2020

Month	Average Rainfall for Winchester, VA (in)*	Average Site Rainfall 1990-2013 (in)	2006 Actual Rainfall (in)	2007 Actual Rainfall (in)	2008 Actual Rainfall (in)	2009 Actual Rainfall (in)	2010 Actual Rainfall (in)	2011 Actual Rainfall (in)	2012 Actual Rainfall (in)	2013 Actual Rainfall (in)	2014 Actual Rainfall (in)	2015 Actual Rainfall (in)	2016 Actual Rainfall (in)	2017 Actual Rainfall (in)	2018 Actual Rainfall (in)	2019 Actual Rainfall (in)	2020 Actual Rainfall (in)	Percent of Average Site Rainfall (%)
January	2.4	2.7	2.0	1.2	1.0	1.4	3.35	0.9	2.0	3.8	1.1	1.4	1.2	2.5	1.8	3.9	3.1	115%
February	2.5	2.3	1.7	1.9	2.3	0.0	4.35	1.4	2.3	0.9	3.2	0.7	2.2	0.8	2.0	3.4	1.8	77%
March	3.1	3.6	0.1	3.7	2.9	1.5	5.7	4.6	1.9	3.9	2.3	1.7	1.0	2.4	0.8	4.6	1.6	44%
April	3.1	3.2	2.8	3.4	6.2	3.2	1.59	6.5	2.5	1.3	1.5	2.9	1.3	1.7	2.4	2.8	3.7	116%
May	3.7	3.8	1.0	1.9	5.2	5.8	3.25	5.6	3.6	2.4	7.2	1.6	3.9	7.0	7.7	5.1	2.9	76%
June	3.9	4.4	9.7	3.5	4.3	4.6	0.6	4.0	3.6	5.2	1.5	3.9	3.8	1.3	9.9	1.6	5.1	115%
July	3.9	3.4	2.2	1.7	3.8	3.0	1.8	3.1	4.3	1.9	4.6	1.8	5.4	6.7	6.1	2.7	2.6	76%
August	3.5	3.1	1.3	2.8	3.5	2.1	3.3	3.4	5.2	2.6	3.7	1.0	2.3	2.1	4.1	4.8	5.0	160%
September	3.1	4.7	6.1	2.0	4.3	1.3	5.7	5.5	4.9	2.5	1.6	3.6	6.1	1.3	5.9	0.3	5.5	117%
October	3.2	3.0	4.3	4.1	1.2	2.7	0.65	3.9	4.3	5.1	5.17	1.65	0.6	3.5	1.3	2.0	0.8	26%
November	3.1	2.9	5.2	1.6	2.5	3.7	1.8	3.0	1.1	1.6	1.83	1.36	0.8	0.9	4.7	0.6	1.8	63%
December	2.5	2.6	0.7	2.8	1.4	5.0	2.0	3.6	1.55	1.5	3.02	2.46	1.5	0.4	3.7	0.3	2.3	89%
Totals to	**37.9**	**39.6**	**36.9**	**30.4**	**38.5**	**34.2**	**34.1**	**45.2**	**37.0**	**32.8**	**36.7**	**24.1**	**30.0**	**30.4**	**50.3**	**32.1**	**36.1**	**91%**

* Source: National Climate Data Center TD 9641 Clim 81